

Student-to-Student Local Anesthesia Injections in Dental Education: Moral, Ethical, and Legal Issues

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Abstract: This article reports the findings of a survey-based study conducted to determine U.S. dental schools' institutional protocols regarding the practice of students' administering local anesthetic injections to fellow students as part of their process of learning this skill. The majority of schools ask students to practice local anesthetic injections on each other without obtaining informed consent.

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The administration of local anesthetic injections by dental students to each other has historically been considered a necessary rite of passage in dental schools across the country. However, medical and dental predoctoral students practicing clinically invasive techniques in preparation for patient experience is not without an inherent potential for complications and may, in fact, have medico-legal implications and ethical considerations for faculty, institutions, and the students themselves.

When a procedure that may foreseeably lead to physical damage is performed on a patient in dentistry or medicine, a dedicated informed consent is routinely obtained. Informed consent helps ensure that the patient is aware of the alternative treatment options and the possible risks and benefits associated with the treatment that will be received. Informed consent can become a vital piece of evidence in cases in which malpractice action is taken, and its presence may serve to protect the doctor or the institution in cases in which adverse outcomes occur.¹ Informed consent can also be helpful to patients in avoiding the onerous inconvenience of meritless lawsuits.

It has been reported that most dental general practitioners do not obtain informed consent prior to administering local anesthesia while, in contrast, dentists with specialty training or advanced training

in anesthesia (e.g., oral and maxillofacial surgeons and dentist anesthesiologists) most often do obtain informed consent for local anesthesia.² The purpose of this study was to begin to gather data on the practice of student-to-student local anesthesia injection as part of dental school instruction and to discuss some of the moral, ethical, and legal issues surrounding this practice.

Methods

After approval of the study by the University of Nevada, Las Vegas, Institutional Review Board, the fifty-six accredited dental schools in the United States were sent an anonymous survey with questions designed to determine each institution's protocol regarding the practice of students' administering local anesthetic injections to fellow students as part of dental instruction. The survey was created by the authors, following a process for determining relevant questions based upon discussions with a cross-section of dental educators from around the country. The four survey questions and results obtained are seen in the tables. The survey was not pilot-tested, nor was the test-retest reliability evaluated.

The survey was administered online via a proprietary web-based survey company, Survey Monkey

(www.surveymonkey.com). An email was sent to the clinical dean or academic dean of each of the fifty-six U.S. dental schools, including a link to the survey, which are also the inclusion criteria for this survey. There were no exclusion criteria. The data were collected by the website and reported anonymously to the survey designer.

Results

Of the fifty-six dental schools contacted, forty-two completed the survey for a response rate of 75 percent. Forty-one (over 97 percent) of the respondents reported that initial injections of local anesthesia for dental procedures were done on fellow students, as noted in Figure 1.

Complications reported from these exercises are seen in Figure 2. Survey respondents were requested to identify “other” complications. There were four “other” responses, which appear in Figure 3. Written informed consent was obtained by four (9.8 percent) of the respondents (Figure 4).

Discussion

With a response rate of 75 percent, the data collected in this study did capture the majority of dental schools and students in the United States. As we anticipated, the vast majority (97.6 percent) of responding dental schools are, in fact, teaching local

anesthesia techniques by having students administer and receive local injections to each other prior to entering clinical practice. Only four of the reporting dental schools indicated that informed consent was routinely obtained for this exercise.

Of the respondents, the majority reported at least one complication, and some listed several complications. We feel the incidence of these complications is likely higher than indicated due to under-reporting by students, clinical faculty, and reporting faculty who completed the survey. The complications reported ranged from syncope to persistent paresthesia as illustrated by the actual case history in the Appendix.

While it is evident that complications of varying severity will occur with the administration of local anesthesia by even the most experienced practitioners, those encountered by students who are still in the initial phases of learning the procedure may have ramifications and consequences unique to this cohort.

For instance, one survey respondent indicated that a dental student had to be premedicated with an anti-anxiety prescription in order to participate in local anesthesia training. This begs the question: do students feel forced by either peer or institutional pressures to receive local anesthesia injections as a training exercise secondary to a coercive situation? On one hand, dental students need to be able to learn proper injection techniques for local anesthesia. Conversely, the students receiving the injections are

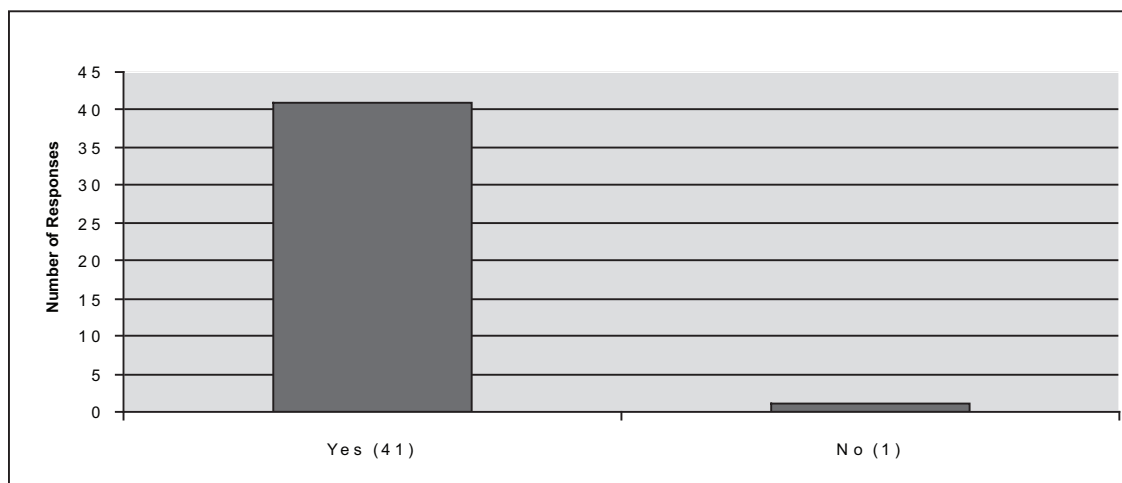


Figure 1. Number of responses to survey question if initial student injections are done on fellow students

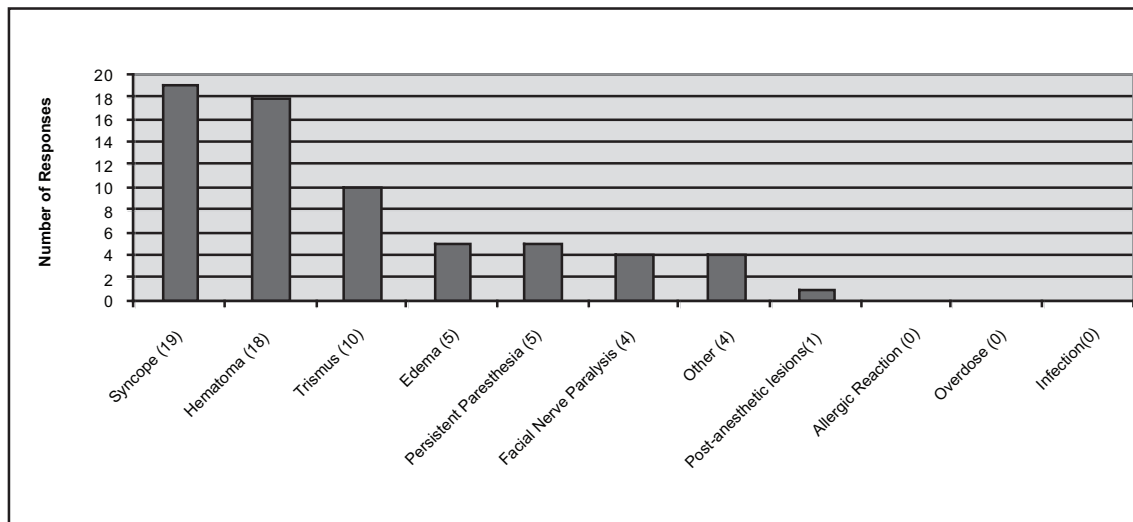


Figure 2. Number of responses to survey question asking whether, if injections are done on fellow students, there have ever been complications associated with the exercise (respondents were asked to mark all that apply)

1. Transient paresthesia, i.e., less than 24 hours
2. Pain and soreness
3. Fearful student had to premedicate with antianxiety agent
4. Through and through IAN LAB, i.e., missed bone, needle extraoral through cheek

Figure 3. Complications named by respondents in response to request to identify complications “other” than those listed

not in any procedural need of local anesthesia and thus are being placed at risk of complications without cause, most often without consent, and occasionally against their will given historical dental school conventions, but with limited options to not participate. In any setting, a patient who is allegedly coerced to be medicated for a reportedly unwanted, unconsented, unnecessary, invasive surgical procedure that may predictably lead to complications would likely be of interest to our legal colleagues. Many faculty members and students see the traditional dental school local anesthesia training process as a rite of passage, but should it be? We raise these issues to bring to the fore the distinct pathways in which medicine and

other areas of dentistry are evolving to address these training issues.

It is unheard of for medically based training programs, such as residency training in anesthesiology, to administer brachial plexus, femoral, sciatic, sub-arachnoid, or any other block or invasive procedures on anyone other than patients actually needing the procedure for their medical care. However, if one is accustomed to the dental training model regarding local anesthesia, such student participation would be totally logical.

The introduction of high fidelity human simulation in medical specialties from crisis management in anesthesiology to laparoscopic surgery has been

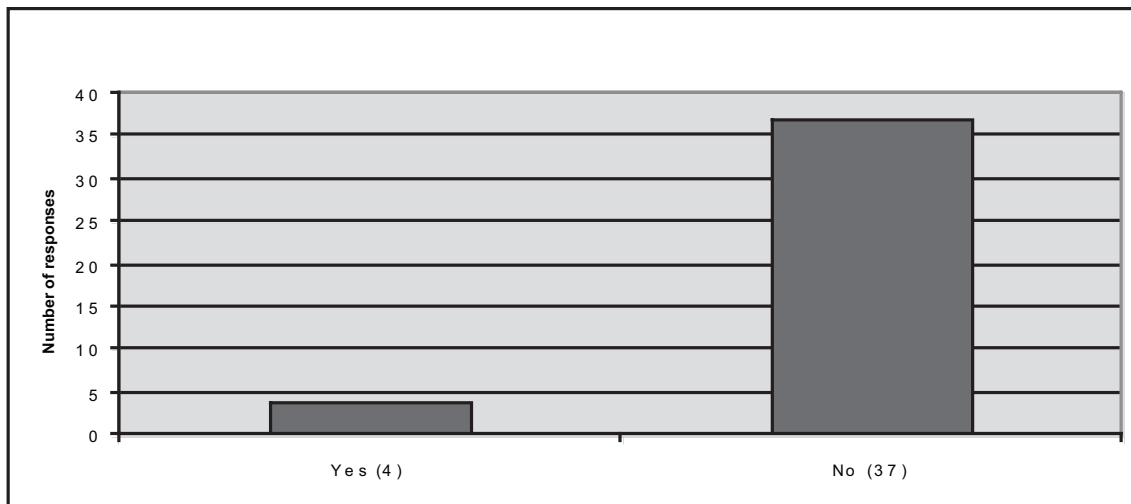


Figure 4. Number of responses to survey question asking whether, when the injection technique is performed on fellow students, a dedicated local anesthetic written informed consent is obtained

a modern foundation of medical education.^{3,4} Clinical dentistry has followed closely with simulation laboratories for training of restorative and prosthetic procedures prior to clinical encounters.⁵

There are several alternative approaches that could possibly be used to teach oral injections without involving fellow students. With advancing technology, virtual reality programs have developed to a level of sophistication at which they have potential for providing students with learning experiences in various types of injections and other surgical skills.⁶ Several European dental schools offer models with electronic devices that indicate the accurate site of injection. Other educational programs have used porcine maxillae or cadavers to teach insertion points and landmarks.⁷ There are options available that would allow the students to learn injection techniques for local anesthesia without first doing injections on each other. Relative proficiency and competence in using either simulation or hands-on techniques remains unknown.

The anonymous aspect of this survey allowed for accurate explanation of situations without revealing names of subjects involved. In future studies it will be interesting to learn the exact methods employed by each school to teach dental injections. One respondent to the survey indicated that his or her institution is not teaching initial injections on

fellow students. Although it would be interesting to do follow-up studies to learn the variety of ways oral injections are being taught, this was not the purpose of the study at hand and was not queried.

Although the American Dental Association (ADA)'s Principles of Ethics and Code of Professional Conduct apply to dental professionals, extrapolating these principles for the point of discussion to dental students is not unrealistic. By means of the ADA guidelines, dental professionals are bound by five distinct principles: patient autonomy, nonmaleficence, beneficence, justice, and veracity.⁸ Each principle is important for its own purpose, but three specifically apply to the exercise of teaching dental injections by requesting that students practice injection techniques on fellow students.

The description of patient autonomy states: "Under this principle, the dentist's primary obligations include involving patients in treatment decisions in a meaningful way, with due consideration being given to the patient's need, desires, and abilities, and safeguarding the patient's privacy." To what extent are dental students' needs, desires, and abilities being taken into consideration when performing injections on each other in a learning environment? Are there circumstances in which administering local anesthesia would be contraindicated, but are overlooked because a student feels a need to fulfill

the assignment? Is there a “need” for the student to “feel” the patient’s pre-operative injection concerns, the actual administration of the local anesthetic, the subsequent anesthesia, and several hours of numbness to better understand what their future patients will go through?

The definition of nonmaleficence states: “This principle expresses the concept that professionals have a duty to protect the patient from harm.” As noted in the survey and the case history in the Appendix, harm has predictably come to patients during this educational exercise. Are students being placed unnecessarily in harm’s way by receiving intraoral injections from novices who have not performed the procedure before?

As for beneficence, “This principle expresses the concept that professionals have a duty to act for the benefit of others.” The administering of local anesthetic itself provides no physical benefit to the student receiving the injection. Does this exercise adequately provide enough benefit to the student receiving the local anesthetic, which may indirectly benefit future patients, to justify the risks of local anesthetic administration?

As with most ethical dilemmas the correct answer lies in the individual. Many ethical considerations surround this long-standing educational practice. A dedicated informed consent may be the beginning of the answer.

Conclusion

The majority of U.S. dental schools are teaching students how to provide oral injections by asking them to perform the procedure on classmates. The

majority of dental schools do not first obtain a written informed consent from students who are receiving oral injections from fellow students. Some students receiving oral injections from fellow students have had complications associated with the procedure. Our goal is neither to condemn or to advocate the practice, but rather to further research in the area and to encourage educators to be more aware of the legal, ethical, and physical safety issues surrounding this practice.

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APPENDIX

Clinical Case History

Upon completion of the didactic portion of the local anesthesia course, first-year dental students were scheduled to participate in three afternoon clinical sessions devoted to technique instruction and clinical application of previously taught injection methods. Students were then paired in order to give and receive injections.

A series of injections was given at each clinical session. The anesthetic blocks given included inferior alveolar, lingual, buccal, posterior superior alveolar, middle superior alveolar, anterior superior alveolar, greater palatine, and nasopalatine. Students were directed, under faculty supervision, to practice each of these injections on their partner.

A twenty-five-year-old male dental student presented to clinic for the lab portion of course on local anesthesia, was scheduled to play the part of the “patient,” and subsequently received injections. The dental student reported that while receiving the lingual/inferior alveolar injection, a shocking sensation was felt in his tongue, causing tremendous pain. The student also reported that he had never felt anything similar previously. Within a few minutes, the pain subsided, and anesthesia was appreciated over the distribution of the lingual and inferior alveolar nerves. The student also reported that since he’d never received an inferior alveolar or lingual injection previously, he thought the pain he experienced was standard for administration of these blocks.

Three hours later, the anesthesia given at all sites other than the lingual nerve had dissipated and could no longer be felt. The student reported that his tongue remained “numb and tingly” through the entire evening and the following morning. When the student reported to school the next day, he asked what the duration of the lingual anesthesia of his tongue would be. He was informed that he had probably suffered nerve damage and that his recovery was uncertain.

For the next six months the student’s tongue remained numb. This caused the student difficulty in speaking and eating. The student was never offered neurosensory testing or any other information, including possible treatment, relating to the complication that had occurred.

After approximately six months, the student’s tongue slowly began to have a normal state of sensation. The student stated that it took an additional three months of gradual improvement for the tongue to feel normal again.

Informed consent for the student local anesthesia exercise is not currently offered at the dental school in question.